RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 1616

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/522,157
Applicant : Elmar KIBLER et al
Filed : January 24, 2005
TC/A.U. : 1616
Examiner : Courtney A. Brown

Docket No. : 3165-116
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RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

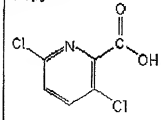
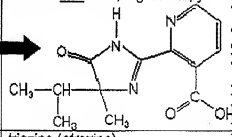
April 20, 2009

Dear Sir:

In the Office Action dated December 19, 2008, claims 1, 8, 9, 23 and 26-33 were rejected. Claims 1, 8, 9, 23 and 26-33 remain in the application and applicants have the following comments regarding the rejections.

Claims 1, 8, 9, 23 and 26-32 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as unpatentable over claims 1, 10, 11, 13 and 17-35 of co-pending application no. 10/522,097. Applicants respectfully point out that component B is different in the two applications. The office action mixes up components B and C in the two applications. The office action indicates that both applications recite imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr as one of the components. This is incorrect as only the present claims recite imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and

imazethapyr. While the disclosure in the present application indicates that component C) can be clopyralid, applicants point out that the claims are limited to triazines. In addition, component C in application serial no. 10/522,097 is sulfonamine or triazine as the claims were narrowed during examination. MPEP § 804 states that "[S]ince the doctrine of double patenting seeks to avoid unjustly extending patent rights at the expense of the public, the focus of any double patenting analysis necessarily is on the claims in the multiple patents or patent applications involved in the analysis". In order for this rejection to be appropriate, in view of the amended claims in both of these applications, it would have to be obvious to use two herbicides selected from the group including imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr (component B in the present application) instead of clopyralid (component B in application serial no. 10/522,097). There is no suggestion in either of these applications that imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr are equivalent to clopyralid. Applicants point out that component B in the respective mixtures not only differ substantially with respect to their chemical structure, but also in their mode of action.

syn. mix.	**US10/522,097**	**US10/522,157**
A +	4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole	4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole
B +	**clopyralid** 	**at least <u>two</u> imis**, e.g. imazapyr 
C	triazine (*atrazine*) or sulfonamide (*flumetsulam*)	triazine (*atrazine*)

Clopyralid belongs to the growth-regulator type herbicides like 2,4-D, dicamba, picloram, etc. These compounds mimic plant growth stimulant substances (hormones) called auxins. Clopyralid enters treated vegetation through the leaves and roots, and replaces natural auxins at binding sites; causing abnormal growth patterns and disrupting the growth processes of the plant. The chemical accumulates in the growing points of the plant, leading to rapid growth, and eventually plant death. Broadleaf plants treated with clopyralid exhibit stem twisting and leaf malformations (cupping, crinkling, parallel veins, leaf strapping). Corn plants exhibit rolled leaves (onion leafing), fused brace roots, stalk bending (goosenecking) and brittleness, and missing kernels. Small grains exhibit twisted flag leaves, sterile florets, or multiple florets, twisted awns and head malformation.

In contrast to clopyralid, imidazolinone compounds, act by inhibiting branched chain amino acid (valine, isoleucine, leucine) biosynthesis. Specifically, they inhibit the catalytic action of acetolactate synthase (ALSase), also known as acetohydroxyacid

synthase and cause different symptoms in the treated plants. Grass plants may be stunted with interveinal yellowing (chlorosis) or purpling. Corn plants may be stunted and show root pruning or stunting. Leaves emerging from the whorl may be yellow to translucent in appearance. Broadleaf plants may be stunted and chlorotic or purple. Leaves may be yellow in appearance and leaf veination may appear red or purple in color.

Applicants respectfully contend that it is clear to one skilled in the art that these two components will perform differently in mixtures and that a synergistic effect observed in one mixture cannot be expected to occur in the other mixture simply because they are both herbicides. As pointed out in applicant's prior response, synergistic effects cannot be predicted from the activity of the individual components. In view of the above discussion, applicants contend that the presently claimed invention would not have been obvious over the claims in application serial no. 10/522,097 and request that this rejection be withdrawn.

Claims 1, 8, 9, 23 and 26-33 were rejected under 35 USC §103(a) as unpatentable over Sievernich et al. The invention disclosed by Sievernich et al. is a synergistic binary mixture, comprising as component A) 4[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5- hydroxy-1H-pyrazole and as component B) inter alia imidazolinone compounds (in group B2) or triazines (in group B12). Applicants point out that imidazolinones and triazines are alternatives in the binary mixture, not third and/or fourth components of the mixture. As a specific embodiment, Sievernich describes **synergistic <u>ternary</u>** mixtures, comprising as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-

5- hydroxy-1 H-pyrazole and as component B) **two** herbicidal compounds from groups B1 to 616 (page 34, lines 43 ff., and claim 25).

syn. mix.	CA 2,334,955		US10/522,157
A +	4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole		4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole
B +	**imidazolinone** (B2) such as **imazapyr***, imazaquin, imazamethabenz, imazamoc, imazapic imazethapyr, imazamethapyr;	**triazine** (B12) such as ametryn, **atrazine***, cyanazine, desmetryn, dimethamethryn, prometon, **prometryn**, **propazine, simazine**, terbumeton, terbutryn, terbutylazine, trietazine;	**at least two imidazolinones**, selected from imazapyr, imazaquin, imazethabenz-methyl, imazamox, imazapic, imazethapyr;
C	**OPTIONALLY**: a herbicidal compound from amongst the groups **B12** and **B14** (page 35, lines 4 to 8, claim 26;		triazine (*atrazine*)

*: exemplified

Dependent claim 25 according to Sievernich et al. describes a particular embodiment of the general inventive idea of synergistic binary mixtures comprising 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4 methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole as component A). The third component in this claim does not need to further contribute to the synergistic effect of the binary mixture.

In further specific embodiment, Sievernich et al. describe synergistic ternary mixtures comprising as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5- hydroxy-1H-pyrazole, as component B) a herbicidal compound from groups B1 to B16 and as a third component (which can be

called C to allow for easier comparison with the present application) a herbicidal compound from amongst the groups B12 and B14. Experimental support is given in tables 76 (nicosulfuron (B2) and dicamba (B14)), tables 77 and 78 (diflufenzopyr (B5) and dicamba (B14)), table 79 (dimethenamide (B9) and atrazine (B12)), table 80 (bentazone (B12) and atrazine (312)), tables 81 and 82 (atrazine (B12) and dicamba (B14)). Again, the third component does not need to support an inventive step, i.e, further contribute to the synergistic effect of the binary mixture. The ternary mixtures described by Sievernich et. al. are specific embodiments of the synergistic binary mixtures, which on their own account for the inventive step.

Applicants point out that there are several significant differences between Sievernich et. al. and the present invention:

- Sievernich et al. does not teach herbicidal mixtures comprising two imidazolinone compounds. The only specific disclosure of a mixture comprising an imidazolinone compound is in Tables 11 and 12 which disclose as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-6-hydroxy-1H-pyrazole and as component B) an imidazolinone compound, i.e. Imazapyr. Unlike the present invention, Sievernich et al. does not disclose the use of two imidazolinone compounds.
- Specific mixtures with other imidazolinone compounds (shown in tables 13-16) comprise as component A) compound Ia.3, which differs from component A) of the present invention in that it features a chlorine-residue in the R^1 position. Ia.33 (component A) of the present invention features a methyl-residue in the respective position. Thus, tables 13-16 cannot be used to reasonably predict the synergistic effect achieved using the present invention.

- Sievernich et al. discloses ternary mixtures comprising two components B) only in generic terms with no specific examples. Sievernich et al. describes binary mixtures comprising as component B) imidazolinone compounds, indicating mixtures with individual compounds only. There is no suggestion to add another herbicidal compound, let alone a second imidazolinone compound to these synergistic mixtures.
- No ternary mixtures disclosed by Sievernich (tables 76 ff.) et al. comprise an imidazolinone compound.
- Sievernich et al. does not suggest or disclose quaternary mixtures at all.

The subject matter of the present invention can be viewed as a selection invention from Sievernich et al. While Sievernich et al. teach binary mixtures comprising as component A) 4-[2-methy1-3-(4,5- dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole and as component B) inter alia an imidazolinone compound, the mixtures according to the present invention comprise four strictly defined individual herbicides. The inventive step of the Sievernich application is substantiated by the unexpected synergistic effect of the binary mixture comprising as component A) 4[2-methyl-3-(4,5-dihyclroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole and inter alia as component B) imazapyr (tables 11 and 12). The office action contends that adding a third and fourth herbicide to a synergistic mixture would be obvious to one skilled in the art with the expectation of obtaining a synergistic mixture with enhanced effectiveness. Synergistic effects are not predictable but depend on the selected compounds or class of compounds. Even a purely additive effect cannot always be predicted based on calculations. Furthermore, the office action overlooks the fact that the addition of the fourth component in the present

invention, the triazine, does not only provide for enhanced effectiveness, i.e. an additive effect, but for an additional synergistic effect which could not have been predicted from the disclosure in Sievernich et al. The fact that the effectiveness of an already highly active herbicidal mixture can yet again be boosted in a more than additive effect is totally unexpected and unpredictable. Applicants point out that the higher the level of control of unwanted vegetation already achieved, the more difficult it is to produce a further improvement by addition of another active ingredient, much less a further synergistic effect.

In order to facilitate the evaluation of the data as originally filed, enclosed is an overview, grouping the data according to plant species, concentration of active ingredients, and component B). A reference to the respective tables in the specification is provided. Tables Ia, IIa and IIb indicate the herbicidal activity for the individual components A), B) and C) and tables IIc) to VIIa show the synergistic effect of the fourth component on top of the activity of the three other components. This overview clearly confirms the inventive concept that the addition of a triazine (fourth component) to a mixture comprising as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-y1)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole and as component B) at least two imidazolinone compounds, results in a synergistic effect. This effect is different and independent from the synergistic effect which is achieved from combining only component A) 4-[2-methyl-3-(4,5- dihydroisoxazol-3-yl-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1 H-pyrazole and as component B) an imidazolinone compound as disclosed in Sievernich et al.

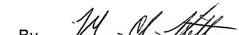
The subject matter of the present invention is a strictly defined quaternary

mixture, which as shown above, differs from the cited prior art. There is no indication in Sievernich et al. how to select the specific components of the present invention. In addition, a second more than additive, i.e. synergistic increase in herbicidal activity, could not have been predicted as synergistic effects in general cannot be predicted. Synergy has been demonstrated for a fair number of representative embodiments encompassed by the present invention. In view of the above discussion and the data in the present application, applicants request that this rejection be withdrawn.

Applicants respectfully submit that all of claims 1, 8, 9, 23 and 26-33 are now in condition for allowance. If it is believed that the application is not in condition for allowance, it is respectfully requested that the undersigned attorney be contacted at the telephone number below.

In the event this paper is not considered to be timely filed, the Applicant respectfully petitions for an appropriate extension of time. Any fee for such an extension together with any additional fees that may be due with respect to this paper, may be charged to Counsel's Deposit Account No. 02-2135.

Respectfully submitted,

By 

Monica Chin Kitts
Attorney for Applicant
Registration No. 36,105
ROTHWELL, FIGG, ERNST & MANBECK
1425 K. Street, Suite 800
Washington, D.C. 20005
Telephone: (202) 783-604

MCK/cb

PF53771 – experimental data as originally filed, proving the synergistic effect of the inventive mixture

Amaranthus retro.

table Ia (specification, table 7)

	application rate [g/ha ai]	Amaranthus retro. Damage [%]	Colby Value E
Ia.29	0.98	60	-
imazapyr + imazethapyr	0.98	20	-
atrazine	15.6	40	-
Ia.29 + imazapyr + imazethapyr + atrazine	0.98 + 0.98 + 15.6	85	81

Gallum aparine

table IIa (specification, table 7)

	application rate [g/ha ai]	Galium aparine Damage [%]	Colby Value E
Ia.29	0.98	20	-
imazapyr + imazethapyr	0.98	20	-
atrazine	15.6	0	-
Ia.29 + imazapyr + imazethapyr + atrazine	0.98 + 0.98 + 15.6	50	36

table IIb (specification, table 8)

	application rate [g/ha ai]	Galium aparine Damage [%]	Colby Value E
Ia.29	1.95	30	-
imazapyr + imazethapyr	1.95	40	-
atrazine	31.25	20	-
Ia.29 + imazapyr + imazethapyr + atrazine	1.95 + 1.95 + 31.25	70	66

PF53771 – experimental data as originally filed, proving the synergistic effect of the inventive mixture

table IIc (specification, table 11)

	application rate [g/ha ai]	Galium aparine Damage [%]	Colby Value E
Ia.29	7.81	70	-
+	+		
imazapyr			
+	7.81		
imazethapyr			
atrazine	125	60	-
Ia.29	7.81	98	88
+	+		
imazapyr			
+	7.81		
imazethapyr			
+	+		
atrazine	125		

table IId (specification, table 15)

	application rate [g/ha ai]	Galium aparine Damage [%]	Colby Value E
Ia.29	7.81	80	-
+	+		
imazapic			
+	7.81		
imazapyr			
atrazine	125	60	-
Ia.29	7.81	98	92
+	+		
imazapic			
+	7.81		
imazapyr	+		
+			
atrazine	125		

Brachiaria plant.

table IIIa(specification, table 10)

	application rate [g/ha ai]	Brachiaria plantaginea Damage [%]	Colby Value E
Ia.29	7.81	85	
+	+		
imazapyr			
+	7.81		
imazethapyr			
atrazine	125	25	
Ia.29	7.81	100	89
+	+		
imazapyr			
+	7.81		
imazethapyr			
+	+		
atrazine	125		

PF53771 – experimental data as originally filed, proving the synergistic effect of the inventive mixture

table IIIb (specification, table 16)

	application rate [g/ha ai]	Brachiaria plantaginea Damage [%]	Colby Value E
Ia.29	3.91	85	-
+	+		
imazapic			
+	3.91		
imazapyr			
atrazine	62.5	20	-
Ia.29	3.91	100	88
+	+		
imazapic			
+	3.91		
imazapyr			
+	+		
atrazine	62.5		

Echinochloa c.g.

table IVa (specification, table 12)

	application rate [g/ha ai]	Echinochloa c.g. Damage [%]	Colby Value E
Ia.29	3.91	85	-
+	+		
imazapyr			
+	3.91		
imazethapyr			
atrazine	62.5	20	-
Ia.29	3.91	95	88
+	+		
imazapyr			
+	3.91		
imazethapyr			
+	+		
atrazine	62.5		

table IVb (specification, table 10)

	application rate [g/ha ai]	Echinochloa c.g. Damage [%]	Colby Value E
Ia.29	7.81	80	-
+	+		
imazapyr			
+	7.81		
imazethapyr			
atrazine	125	30	-
Ia.29	7.81	100	86
+	+		
imazapyr			
+	7.81		
imazethapyr			
+	+		
atrazine	125		

PF53771 – experimental data as originally filed, proving the synergistic effect of the inventive mixture

table IVc (specification, table 14)

	application rate [g/ha ai]	Echinochloa crus galli Damage [%]	Colby Value E
Ia.29 + imazapic + imazapyr	7.81 + 7.81	80	-
atrazine	125	30	-
Ia.29 + imazapic + imazapyr + atrazine	7.81 + 7.81 + 125	100	86

table IVd (specification, table 16)

	application rate [g/ha ai]	Echinochloa crus galli Damage [%]	Colby Value E
Ia.29 + imazapic + imazapyr	3.91 + 3.91	80	-
atrazine	62.5	20	-
Ia.29 + imazapic + imazapyr + atrazine	3.91 + 3.91 + 62.5	98	84

Polygonium pers.

table Va (specification, table 13)

	application rate [g/ha ai]	Polygonium persicaria Damage [%]	Colby Value E
Ia.29 + imazapyr + imazethapyr	3.91 + 3.91	70	-
atrazine	62.5	40	-
Ia.29 + imazapyr + imazethapyr + atrazine	3.91 + 3.91 + 62.5	100	82

PF53771 – experimental data as originally filed, proving the synergistic effect of the inventive mixture

table Vb (specification, table 11)

	application rate [g/ha ai]	Polygonium persicaria Damage [%]	Colby Value E
Ia.29 + imazapyr + imazethapyr	7.81 + 7.81	75	-
atrazine	125	60	-
Ia.29 + imazapyr + imazethapyr + atrazine	7.81 + 7.81 + 125	100	90

table Vc (specification, table 17)

	application rate [g/ha ai]	Polygonium persicaria Damage [%]	Colby Value E
Ia.29 + imazapic + imazapyr	3.91 + 3.91	70	-
atrazine	62.5	40	-
Ia.29 + imazapic + imazapyr + atrazine	3.91 + 3.91 + 62.5	100	82

Pharbitis pur.

table VIa (specification, table 12)

	application rate [g/ha ai]	Pharbitis purpurea Damage [%]	Colby Value E
Ia.29 + imazapyr + imazethapyr	3.91 + 3.91	50	-
atrazine	62.5	80	-
Ia.29 + imazapyr + imazethapyr + atrazine	3.91 + 3.91 + 62.5	100	90

PF53771 – experimental data as originally filed, proving the synergistic effect of the inventive mixture

Abutilon theo.

table VIIa (specification table 14)

	application rate [g/ha ai]	Abuthilon theoprasti Damage [%]	Colby Value E
Ia.29 + imazapic + imazapyr	7.81 + 7.81	85	-
atrazine	125	30	-
Ia.29 + Imazapic + imazapyr + atrazine	7.81 + 7.81 + 125	100	90